


separating a first operation range for unthrottled intake air control from a second operation range for throttled intake air control;


 varying valve timing of the intake means with the throttle valve held in the neighborhood of the wide open throttle position to perform throttled intake air control during said first operation range; and varying throttle valve position of the throttle valve with valve timing of the intake means held to provide a valve opening duration in the neighborhood of the minimum valve opening duration.

6. (Amended) A system for controlling intake air of an internal combustion engine, the engine having at least one combustion chamber, the system comprising:

at least one intake valve provided for the combustion chamber;

an electromagnetic driver operatively connected to each intake valve for opening said intake valve;

an intake manifold with a throttle valve communicating with each intake valve;
and

 sensors providing operation variables indicative of operator torque request command and engine speed;

a control unit receiving said operation variables to determine a first operation parameter indicative of target intake air based on said operator torque request command and said engine speed,

said control unit being operative to make a selection based on said first operation parameter indicative of target intake air between a first operation range for unthrottled intake air control and a second operation range for throttled intake air control, said first and second operation range being separated from each other by a threshold value of target intake air at each of varying values of engine speed, said threshold value increases as engine speed increases,

said control unit being operative to vary, with valve opening timing held in the neighborhood of the top dead center, valve closure timing of said intake valve with said throttle valve held in the neighborhood of the wide open throttle position to perform

unthrottled intake air control upon selection of said first operation range, and vary throttle valve position of said throttle valve with valve timing of said intake valve held to provide a valve opening duration in the neighborhood of the minimum valve opening duration that is variable with varying engine speed,

2
said control unit being operative to determine a second operation parameter indicative of a target valve closure timing of said intake valve based on said target intake air,

3
said control unit being operative to provide a response adjustment to said second operation parameter indicative of said target closure timing to give a processed second operation parameter, and

said control unit being operative to control said electromagnetic driver to cause said intake valve to close at valve closure timing indicated by said processed second operation parameter.
